

### **REMARKS**

1. (amendments to the claims) With the present response Applicants amend claims 1, 3, and 4, cancel claim 8 and add new claim 11. Support for the amendment to claim 1 can be found, for example, at page 8 line 13, page 9 line 13, or page 12 line 12.

2. (35 USC 112, first paragraph, claim 8) In section 2 of the Final Action mailed March 4, 2009, the Examiner rejects claim 8 on 35 USC 112, first paragraph grounds. Applicants have canceled claim 8, thus rendering the Examiner's rejection moot.

3. (35 USC 112, first paragraph, claims 1, 3-6, 8 and 10) In section 3 of the Final Action, the Examiner rejects claims 1, 3-6, 8 and 10 under 35 USC 112, first paragraph. In particular, the Examiner makes reference to placement of quantum dots on a rotating data storage medium using ink technology and submits that the application does not enable one of ordinary skill to make and/or use the invention without undue experimentation. The following *Wands* factors are used by the Examiner: (A) The nature of the invention; (B) The state of the prior art; (C) The amount of direction provided by the inventor; and (D) The existence of working examples.

(A) Nature of the invention and (B) The state of the prior art. The Examiner identifies the nature of the invention in the increase of the storage capability of a disk drive by several orders of magnitude and then looks for evidence, in the prior art, that placing quantum dots at a high level of storage density is well known to the person skilled in the art. In particular, the Examiner is looking for documents directed to optical recording.

The Applicants have performed a search for documents in the optical field publicly available before the priority date of the present application and have found the following eight documents (included in an Information Disclosure Statement filed concurrently with the present Submission with RCE)

1) US 6,337,117 to Maenosono (published on January 8, 2002)

a) The technical field of Maenosono is an optical data storage device (title, abstract, etc). Nanometer sized particles (“nanoparticles”) are mentioned throughout the entire disclosure.

b) See, e.g., Figs. 8A, 8B, 9, 10A, 10B, 12, 13A, 14A, 14B, 14C, 15, 16A, 16B, 17, 18, 19A, 19B, 20, 23, 24, 25A, 25B, 26, 27, 28, 29, 30A, 30B, 32, 34A, 35A, 37A, 38, 39A, 39B, 39C, 42A, 43, 44A and related portions of the specification.

c) Dimension of the nanoparticles is discussed, for example, at column 11, lines 3-11.

d) Ink-jet methods used in combination with the nanoparticles are discussed in Figures 28, 29 and related portions of the specification. See also Example 6-1, column 38, lines 54-61.

e) Exposure of nanoparticles to a laser beam is described, for example, at column 3, lines 43-50. An imaging or writing process through excitation of a laser beam is shown in Fig. 2A and related portions of the specification. See also Figs. 34A and 34B.

f) Fluorescence is discussed, for example, at column 10, lines 34-38.

2) J. Tominaga et al, “Readout characteristics and mechanism of light-scattering mode Super-RENS disks”, Optical Storage and Optical Information Processing, Proceedings of SPIE Vol. 4081 (2000) pp. 86-94

a) The technical field of Tominaga is optical data storage devices.

b) Presence of nanometer sized marks is discussed, for example, in Figs. 6, 10A, 10B and

c) Laser radiation methods are discussed in paragraph 4 (conclusions), page 94.

3) T. Shima et al, “Super-Resolution Readout for Magneto-Optical Disk by Optimizing the Deposition Condition of Non-Magnetic Mask Layer”, Mat. Res. Soc. Symp. Proc. Vol. 674 (2001) pp. v221-v227

a) The technical field of Shima is magneto-optical disks.

b) Shima discusses in detail recording and retrieving (readout) of marks having a size of less than 370 nm. See, for example, abstract page v221.

c) Recording and reading at distances of less than 50 nm is discussed in the first paragraph of the introduction (page v221) where reference is also made to previous publications [1] and [2], see also reference section at page v227.

4) S. B. Fuller et al, “Ink-Jet Printed Nanoparticle Microelectromechanical Systems” Journal of Microelectromechanical Systems, Vol. 11, No. 1, February 2002

a) The technical field of Fuller is ink-jet printing of nanoparticles

b) Ink-jet printing of nanoparticles on a substrate is described throughout the whole document, where a printing apparatus is not only shown with drawings but also with photographs (i.e. actually built). See Figs. 1-8.

5) G. I. Frolov, “Film Carriers for Super-High Density Magnetic Storage”, Technical Physics, Vol. 46, No. 12 (2001) pp. 1537-1544

a) The technical field of Frolov is nanometer carriers for magneto-optic storage devices.

b) Deposition of nanometer carriers through a pulsed laser is shown in Fig. 7, p. 1542.

6) C. Curtis et al., “Metallizations by Direct-Write Inkjet Printing”, NREL/CP-520-31020, October 2001

- a) The technical field of Curtis is ink-jet printing of metal particles
- b) Ink-jet printing of nanoparticles is discussed, for example, in the “Spray Deposition with Composite Ag Nanoparticle/Metal-Organic Ink” paragraph of Section 3 right under Fig. 2.

7) “New ink-jet technology for the formation of ultra fine dots less than 1/1000 the size of currently achieved”, AIST press release, April 1, 2002

- a) The technical field of AIST is inkjet printers
- b) Inkjet printing of sub-micrometer dots is shown in Figures 1 and 2. See also the last page of the publication, line 2 “minimum size of less than one micron.”

8) “Nozzle device and nozzle for atomization and/or filtration and methods for using the same” PCT publication WO02/18058 published on March 7, 2002

- a) The technical field is nozzle devices and orifices
- b) Sub-micron nozzle shapes are discussed, for example, at page 7 line 4, page 9 line 9, page 11 line 7, page 11 lines 22-23, page 11 line 26, page 14 line 29, page 15 line 9.

In view of the above commented eight documents (copy of which is being submitted with an Information Disclosure Statement filed concurrently with the present submission), Applicants submit that Wands’ factors (A) and (B) should weigh in Applicants’ favor.

(C) The amount of direction provided by the inventor

The thrust of the Examiner’s argument is that typical inkjet printing does not allow (or it not known to allow) disk spot sizes of 0.32  $\mu\text{m}$ . However, droplets and/or nozzle sizes of such dimensions are shown at least in the above mentioned references 7) and 8), available to the person skilled in the art before the priority date of the present application. Therefore, also this factor should weigh in the Applicants’ favor.

(D) The existence of working examples

In the Action the Examiner states that no working examples are provided by the Applicants. However, the Examiner should also note that the technical field of the present application is not biotechnology or chemistry. Applicants have provided description and figures (see Figures 1 and 2) of the claimed method and have shown above that a wide range of public documents were available to the person skilled in the art at the time of the priority date of the application.

Therefore, in view of the above, Applicants submit that enablement under 35 USC 112, first paragraph is satisfied for claims 1, 3-6, 8 and 10.

4. (rejections of claim 8 under 35 USC 112 first and second paragraphs) In sections 4 and 5 of the Action the Examiner rejects claim 8 under 35 USC 112 first and second paragraph. Applicants have canceled claim 8 thus rendering the Examiner's rejections moot.

5. (rejections under 35 USC 103) In section 8 of the the Action, the Examiner rejects claims 1, 3-6 and 8 under 35 USC 103(a) as being unpatentable over US 6.692,031 to McGrew over US 2002/0001274 to Nakajima. Applicants respectfully disagree with the Examiner, both because i) the combination between McGrew and Nakajima is improper and ii) the features of claim 1 as amended are not found in the combined teachings of McGrew and Nakajima.

i) Improper combination

The quantum dots of McGrew are placed on a surface to provide labels (McGrew, column 3, lines 33-44, column 5, line 8, see also elements 410 in Figure 3 printed onto a paper stock 420 to make rolls of labels 435). Nakajima describes an optical recording medium with pits. How can the labels of McGrew be inserted in the pits of Nakajima? What would be the reason for doing so? In the Action, the motivational argument provided by the Examiner is that Nakajima discloses a need to record unique information on a disk. That's fine. However, the only 'unique information' shown in McGrew is a batch of quantum dots located on a bi-dimensional surface and

coated by gelatin (McGrew, column 5, line 12). McGrew's arrangement is clearly unsuitable for use with Nakajima's disc. Moreover, any kind of modification to be made on McGrew's arrangement to make it suitable for Nakajima, would clearly make McGrew unsatisfactory for its intended purpose (MPEP 2143.01 V), given McGrew's intention and need to provide security labels.

ii) The features of claim 1 are not found in the combination of McGrew and Nakajima  
Amended claim 1 recites "nanometer beads filled with nanometer sized particles". Applicants were not able to find such feature in McGrew (or Nakajima). As also noted above, McGrew describes a spread of quantum dots on a surface, coated by gelatin. In other words, McGrew shows a substantially bi-dimensional arrangement of a batch of quantum dots of different sizes, which is markedly different from a plurality of nanometer beads filled with nanometer sized particles.

In view of these arguments, it is submitted that claim 1 is patentable over McGrew and Nakajima, together with claims 3-6, at least in view of their dependence on claim 1. Similar arguments apply to independent claim 11, which contains all of the above mentioned features of claim 1.

6. (requests) In view of the above, reconsideration and allowance of all the claims are respectfully solicited.

7. (fees) RCE fees and a two-month extension fee are being paid concurrently with the filing of this submission. The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 50-4194. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136(a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection herewith may be charged to deposit account no. 50-4194. Please ensure that the Attorney Docket Number is referred to when charging any payments or crediting any overpayments for this case.

I hereby certify that this correspondence  
is being electronically transmitted on

July 31, 2009

(date of deposit)

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Respectfully submitted,

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